

WHAT IS CLAIMED IS:

1. An overlay frame processing method for showing a display frame and an overlay frame outputted by a digital image processing device on a display, said display frame and said overlay frame respectively consisting of display frame pixel data and overlay frame pixel data at corresponding positions, said method comprising steps of:

performing an alpha-blending operation on said display frame pixel data and said overlay frame pixel data to obtain an alpha-blended pixel data; and

substituting said alpha-blended pixel data for said overlay frame pixel data to be displayed by said display.

2. The method according to claim 1 wherein a color value C4 of said alpha-blended pixel data is determined by a formula  $C4 = (1-A1) * C1 + A1 * C2$ , where C1 indicates a color value of said display frame pixel data, C2 indicates a color value of said overlay frame pixel data, and A1 indicates an alpha value lying between 0 and 1.
3. The method according to claim 2 wherein said alpha value A1 is one of the parameters included in said display frame pixel data.
4. The method according to claim 2 wherein said alpha value A1 is a preset value.
5. An overlay frame processing method for showing a display frame and a first and a second overlay frames outputted by a digital image processing device on a display, said display frame and said first and said second overlay frames respectively consisting of display frame pixel data and first and second overlay frame pixel data, said method comprising steps of:

performing an alpha-blending operation on said display frame

pixel data and said first overlay frame pixel data of a first pixel point to obtain a first alpha-blended pixel data;

performing an alpha-blending operation on said display frame pixel data and said second overlay frame pixel data of a second pixel point to obtain a second alpha-blended pixel data; and

displaying said first and said second alpha-blended pixel data at said first and said second pixel points, respectively.

6. The method according to claim 5 wherein a color value  $C4$  of said first alpha-blended pixel data is determined by a formula  $C4 = (1-A1) * C1 + A1 * C2$ , where  $C1$  indicates a color value of said first display frame pixel data,  $C2$  indicates a color value of said first overlay frame pixel data, and  $A1$  indicates an alpha value lying between 0 and 1.

7. The method according to claim 5 wherein a color value  $C5$  of said second alpha-blended pixel data is determined by a formula  $C5 = (1-A2) * C1 + A2 * C3$ , where  $C1$  indicates a color value of said second display frame pixel data,  $C3$  indicates a color value of said second overlay frame pixel data, and  $A2$  indicates an alpha value lying between 0 and 1.

8. The method according to claim 5 wherein said first and said second overlay frames overlap with each other to form an overlapped region, and said method further comprises steps of:

performing an alpha-blending operation on said display frame pixel data and said first and said second overlay frame pixel data of a third pixel point in said overlapped region to obtain a third alpha-blended pixel data; and

displaying said third alpha-blended pixel data at said third pixel

point.

9. The method according to claim 8 wherein a color value  $C_6$  of said third alpha-blended pixel data is determined by a formula  $C_6 = A_1 * [A_2 * C_2 + (1 - A_2) * C_3] + (1 - A_1) * C_1$ , or  $C_6 = A_2 * C_2 + (1 - A_2)(1 - A_1) * C_3 + A_1 * C_1$ ,

where  $C_1$  indicates a color value of display frame pixel data in said overlapped region,  $C_2$  indicates a color value of overlay frame pixel data in said overlapped region,  $C_3$  indicates a color value of overlay frame pixel data in said overlapped region, and  $A_1$  and  $A_2$  are alpha values lying between 0 and 1.

10. The method according to claim 9 wherein said alpha value  $A_1$  is one of the parameters included in said display frame pixel data, and said alpha value  $A_2$  is a preset value.

11. The method according to claim 9 wherein said alpha values  $A_1$  and  $A_2$  are preset values.

12. An overlay frame processing device for showing a display frame and an overlay frame outputted by a digital image processing device on a display, said display frame and said overlay frame respectively consisting of display frame pixel data and overlay frame pixel data at corresponding positions, comprising:

a display controller reading and transmitting said display frame pixel data;

an overlay engine reading and transmitting said overlay frame pixel data;

an alpha-blending engine in communication with said display controller and said overlay engine, receiving and performing an alpha-blending operation on said display frame pixel data and said

overlay frame pixel data to obtain an alpha-blended pixel data; and

a digital-to-analog converter in communication with said alpha-blending engine, converting said alpha-blended pixel-data into an analog signal and transmitting said analog signal to said display to be displayed.

13. The device according to claim 12 wherein said display frame pixel data and said overlay frame pixel data are stored in a memory of said digital image processing device.

14. The device according to claim 12 wherein said alpha-blending engine realizes an alpha value from said display frame pixel value to perform said alpha-blending operation.

15. The device according to claim 12 wherein said alpha-blending engine realizes an alpha value from a memory of said digital image processing device to perform said alpha-blending operation.